Claims

What is claimed is:

1. A communication method comprising:

at least one of a communication device sending a first data unit comprising a physical layer (PHY) header or a communication device receiving a first data unit comprising a PHY header;

wherein the PHY header comprises one or more fields to indicate whether a response data unit is intended to follow the first data unit, and to indicate the type of the response data unit, when a response data unit is intended to follow the first data unit;

wherein the type of the response data unit can be used to estimate the duration of the response data unit;

wherein

the one or more fields comprise at least three bits,

a first value of the one or more fields indicates that no response data unit is intended to follow the first data unit,

a second value of the one or more fields indicates the intended response data unit is a null data packet type,

a third value of the one or more fields indicates the intended response data unit having the size equal to or smaller than that of normal ACK,

a fourth value of the one or more fields indicates the intended response data unit having the size equal to or smaller than that of normal Block Acknowledgement but larger than that of normal ACK, and

a fifth value of the one or more fields indicates the intended response data unit having the size larger than the size indicated by the fourth value listed above, or wherein

the one or more fields comprise two bits,

a first value of the one or more fields indicates that no response data unit is intended to follow the first data unit,

a second value of the one or more fields indicates the intended response data unit is a null data packet type,

a third value of the one or more fields indicates the intended response data unit having the size equal to or shorter than a pre-determined value but larger than the size indicated in the second value, and

a fourth value of the one or more fields indicates the intended response data unit having the size larger than the size indicated by the third value.

2. The communication method of claim 1,

wherein the first data unit is a null data packet type PS-Poll and at least one of the fields in the PHY header indicates that the following response data unit is a null data packet type ACK and the null data packet type ACK is different from other null data packet type ACK and used only for the null data packet type PS-Poll.

3. The communication method of claim 1,

wherein at least a field indicates whether the response data unit is at least one of a normal response data type or a null data packet type.

4. The communication method of claim 3,

wherein the normal response data unit is at least one of normal ACK, normal Block ACK or a polling response frame.

5. The communication method of claim 3,

wherein the field comprises at least 2 bits and only one value of the field is used to indicate all the short data response units including at least one of the following: a null data packet format of ACK, a null data packet format of short response frame to null data type PS-Poll, a null data packet format of CTS, and a null data packet format of Block Ack frame.

~~6. The communication method according to claim 1,~~

~~wherein the indication comprises at least three bits;~~

~~wherein a first value of the field indicates that no response data unit is intended to follow the first data unit; and~~

~~wherein a second value of the field indicates the intended response data is a null data packet type;~~

~~wherein a third value of the field indicates the intended response data having the size equal to or smaller than that of normal ACK;~~

~~wherein a fourth value of the field indicates the intended response data having the size equal to or smaller than that of normal Block Acknowledgement but larger than that of normal ACK; and~~

~~wherein a fifth value of the field indicates the intended response data unit having the size larger than the size indicated by the fourth value listed above.~~

~~7. The communication method according to claim 1,~~

~~wherein the field comprises two bits;~~

~~wherein a first value of the field indicates that no response data unit is intended to follow the first data unit;~~

~~wherein a second value of the field indicates the intended response data is a null data packet type;~~

~~wherein a third value of the field indicates the intended response data having the size equal to or shorter than a pre-determined value but larger than the size indicated in the second value; and~~

~~wherein a fourth value of the field indicates the intended response data unit having the size larger than the size indicated by the third value.~~

~~8~~6. The communication method of claim 1,

wherein the PHY header comprises an indication of a response data unit for at least one of speed frame exchange or TXOP sharing.

~~9~~7. The communication method of claim ~~8~~6,

wherein the type of the response data unit is a normal response data type for at least one of speed frame exchange or TXOP sharing.

~~10~~8. The communication method of claim ~~9~~7,

wherein the response data unit is a normal ACK and its Duration field for NAV setting protects the following transmission in one TXOP.

~~11~~9. The communication method of claim ~~8~~6,

wherein the type of the response data unit is a null data packet type for at least one of speed frame exchange or TXOP sharing.

~~12~~10. The communication method of claim ~~11~~9,

wherein the first data unit itself is a null data packet type PS-Poll and the response data unit is a null data packet response frame to null data type PS-Poll.~~,~~

~~13~~11. The communication method of claim 1,

wherein the first data unit is at least one of a null data packet type ACK or a null data packet type response frame responding to a null data type PS-Poll, and two or more bits in at least two fields of the first data unit indicate that there is no response data unit intended to follow the first data unit.

~~14~~12. The communication method of claim ~~13~~11,

wherein the Duration Indication field set to 0 and the Duration field set to 0 indicates that there is no response data unit intended to follow the first data unit.

~~15~~13. The communication method of claim 1,

wherein the first data unit is a null data packet type ACK or a null data packet type response frame responding to a null data type PS-Poll, and two or more bits in at least two fields of the first data unit indicate that the response data unit is a type with the size larger than that of a normal data unit.

~~16~~14. The communication method of claim ~~15~~13,

wherein the Duration Indication field set to 1 and the Duration field set to 0 indicate that the response data unit is a type with the size larger than that of a normal data unit.

~~17~~15. The communication method of claim 1,

wherein the intended receiver defers at least one of its transmission or channel access for at least a duration based on the indication for the type of the response data unit.

~~18~~16. The communication method of claim ~~17~~15,

wherein the type of the response data unit is a null data packet frame.

~~19~~17. The communication method of claim ~~17~~15,

wherein the type of the response data unit is a normal frame with the size equal to or short than that of a normal ACK.

~~20~~18. The communication method of claim ~~17~~15,

wherein the type of the response data unit is a normal frame with the size equal to or smaller than that of a normal Block ACK but larger than that of a normal ACK.

Claims

What is claimed is:

1. A communication method comprising:

at least one of a communication device sending a first data unit comprising a physical layer (PHY) header or a communication device receiving a first data unit comprising a PHY header;

wherein the PHY header comprises one or more fields to indicate whether a response data unit is intended to follow the first data unit, and to indicate the type of the response data unit, when a response data unit is intended to follow the first data unit;

wherein the type of the response data unit can be used to estimate the duration of the response data unit;

wherein

the one or more fields comprise at least three bits,

a first value of the one or more fields indicates that no response data unit is intended to follow the first data unit,

a second value of the one or more fields indicates the intended response data unit is a null data packet type,

a third value of the one or more fields indicates the intended response data unit having the size equal to or smaller than that of normal ACK,

a fourth value of the one or more fields indicates the intended response data unit having the size equal to or smaller than that of normal Block Acknowledgement but larger than that of normal ACK, and

a fifth value of the one or more fields indicates the intended response data unit having the size larger than the size indicated by the fourth value listed above, or wherein

the one or more fields comprise two bits,

a first value of the one or more fields indicates that no response data unit is intended to follow the first data unit,

a second value of the one or more fields indicates the intended response data unit is a null data packet type,

a third value of the one or more fields indicates the intended response data unit having the size equal to or shorter than a pre-determined value but larger than the size indicated in the second value, and

a fourth value of the one or more fields indicates the intended response data unit having the size larger than the size indicated by the third value.

2. The communication method of claim 1,

wherein the first data unit is a null data packet type PS-Poll and at least one of the fields in the PHY header indicates that the following response data unit is a null data packet type ACK and the null data packet type ACK is different from other null data packet type ACK and used only for the null data packet type PS-Poll.

3. The communication method of claim 1,

wherein at least a field indicates whether the response data unit is at least one of a normal response data type or a null data packet type.

4. The communication method of claim 3,

wherein the normal response data unit is at least one of normal ACK, normal Block ACK or a polling response frame.

5. The communication method of claim 3,

wherein the field comprises at least 2 bits and only one value of the field is used to indicate all the short data response units including at least one of the following: a null data packet format of ACK, a null data packet format of short response frame to null data type PS-Poll, a null data packet format of CTS, and a null data packet format of Block Ack frame.

6. The communication method of claim 1,

wherein the PHY header comprises an indication of a response data unit for at least one of speed frame exchange or TXOP sharing.

7. The communication method of claim 6,

wherein the type of the response data unit is a normal response data type for at least one of speed frame exchange or TXOP sharing.

8. The communication method of claim 7,

wherein the response data unit is a normal ACK and its Duration field for NAV setting protects the following transmission in one TXOP.

9. The communication method of claim 6,

wherein the type of the response data unit is a null data packet type for at least one of speed frame exchange or TXOP sharing.

10. The communication method of claim 9,

wherein the first data unit itself is a null data packet type PS-Poll and the response data unit is a null data packet response frame to null data type PS-Poll.

11. The communication method of claim 1,

wherein the first data unit is at least one of a null data packet type ACK or a null data packet type response frame responding to a null data type PS-Poll, and two or more bits in at least two fields of the first data unit indicate that there is no response data unit intended to follow the first data unit.

12. The communication method of claim 11,

wherein the Duration Indication field set to 0 and the Duration field set to 0 indicates that there is no response data unit intended to follow the first data unit.

13. The communication method of claim 1,

wherein the first data unit is a null data packet type ACK or a null data packet type response frame responding to a null data type PS-Poll, and two or more bits in at least two fields of the first data unit indicate that the response data unit is a type with the size larger than that of a normal data unit.

14. The communication method of claim 13,

wherein the Duration Indication field set to 1 and the Duration field set to 0 indicate that the response data unit is a type with the size larger than that of a normal data unit.

15. The communication method of claim 1,

wherein the intended receiver defers at least one of its transmission or channel access for at least a duration based on the indication for the type of the response data unit.

16. The communication method of claim 15,

wherein the type of the response data unit is a null data packet frame.

17. The communication method of claim 15,

wherein the type of the response data unit is a normal frame with the size equal to or short than that of a normal ACK.

18. The communication method of claim 15,

wherein the type of the response data unit is a normal frame with the size equal to or smaller than that of a normal Block ACK but larger than that of a normal ACK.